THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.

Paper No. 24

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte PATRICK C. WANG[1]

Appeal No. 96-0665
Application 08/179,887

ON BRIEF

Before HAIRSTON, KRASS, and JERRY SMITH, Administrative Patent Judges.

KRASS, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal from the final rejection of claim 16. Claims 17 through 21, the only other pending claims, have been indicated as being directed to allowable subject matter and are no longer before us on appeal.

---

[1] Application for patent filed January 10, 1994. According to appellant, this application is a continuation of Application 07/901,351, filed June 19, 1992.

The invention pertains to a single polysilicon layer flash E2PROM cell, the nature of which is best illustrated by reference to independent claim 16, reproduced as follows:

16. An E^2PROM cell comprising:

a substrate of a first conductivity type having source, drain and control gate regions of a second conductivity type disposed along a surface of the substrate and extending into the substrate, the source and drain regions defining a channel region therebetween and being separated from the control gate region;

an oxide layer formed on the surface of the substrate and having portions located over the source, drain, channel and control gate regions; and

a floating gate formed over the oxide layer and comprising polysilicon, the floating gate being part of the only layer of the cell containing polysilicon, the floating gate consisting solely of:

a first portion located over the control gate region; and

an elongated second portion including:

a first part located over portions of the source and drain regions and over the channel region, and

a second part connected between the first portion and the first part.

The examiner relies on the following reference:

Adam	4,425,631	Jan. 10, 1984

Claim 16 stands rejected under 35 U.S.C. § 102(b), or, alternatively, 35 U.S.C. § 103, as being anticipated by, or obvious over, Adam.

Reference is made to the briefs and answer for the respective positions of appellant and the examiner.

OPINION

We affirm.

The examiner sets forth his reasoning regarding the rejection of claim 16, at pages 2-3 of the answer. Appellant makes only two arguments regarding the instant claim limitations vis à vis that which is disclosed by Adam. First, appellant argues that claim 16 distinguishes over the embodiments of Figs. 3, 4 and 5 of the reference because of the claimed negative limitation of the floating gate structure "consisting solely of . . ." Second, appellant argues that with regard to Adam's Fig. 5, the n+-doped source/erase region 25 and drain/write region 16 have different conductivity type than the p+-doped diffusion region 4 while claim 16 calls for the source, drain and control gate regions to be all of the same conductivity type.

Addressing appellant's first argument, we have no problem with negative limitations appearing in the claim. However, we do not view the claim language to be as restrictive as appellant apparently believes the language to be.

We apply the claim language of interest to Figure 5 of Adam, as depicted on page 4 of the reply brief. Identifying the

floating gate in Adam as Fg, it is seen that the floating gate "consisting solely" of "a first portion" (say, beginning from the line going through the label "Fg" in Adam's Fig.5 as depicted on page 4 of the reply brief and extending to the right all the way to the end of the floating gate)[2]; and an elongated portion including "a first part" (as depicted by appellant in the annotated Fig. 5 at page 4 of the reply brief) located over portions of the source and drain regions and over the channel region, and a "second part" (that portion indicated by appellant as the "second part between first part and first portion" on the annotated Fig. 5 at page 4 of the reply brief). Accordingly, Fig. 5 (as well as either one of Figs. 3 or 4, for similar reasons) of Adam does, indeed, disclose the subject matter of claim 16.

Now, appellant focuses on the portion of Fg, in Adam, which overlies diffusion region 4 and contends that this cannot be the claimed "second part" because it does not lie between the first part and the first portion. We agree. However, there is nothing

[2] Note that this "first portion" is located over the control gate region, as shown by appellant at page 4 of the reply brief.

in the claim which precludes this portion of Fg from being part of the claimed "first portion."

We understand that appellant intended to limit the claim such that *only* doped regions overlain by the floating gate are the source, drain and control gate regions and that the floating gate should not extend beyond these areas to cover additional doped regions (such as region 4 in Adam) [see page 10 of the principal brief]. If the claim included such limitations, we would agree that this would distinguish over that which is taught by Adam.[3] Unfortunately, this is not what the language of claim 16 requires. According to the claim language, the floating gate is "consisting solely" of a first portion and an elongated second portion, the second portion having a first and second part, as claimed. This much is shown by Adam. Contrary to appellant's intent, there is nothing in the claim which precludes the first

[3] A possible problem may arise, however, in that it is not all that clear whether what appellant intended is supported by the disclosure. For example, viewing appellant's Fig. 5, as depicted by appellant at the top of page 4 of the reply brief, the top portion of first portion 168 appears to overlie more than control gate region 142 and the very top of the first part of the elongated second portion appears to go a bit further than the end of the source and drain regions 138, 140. Thus, it would appear that appellant's own disclosure suggests that the floating gate may, in fact, extend beyond the doped regions of the source, drain and control gate regions, contrary to what appellant argues [principal answer - page 10] as his intent.

portion from being located over the control gate region *and also some other region such as region 4 of Adam.*

Turning now to appellant's second argument, claim 16 requires a substrate of a first conductivity type. Adam shows a substrate 3 of p-conductivity type. Claim 16 also requires the source, drain and control gate regions to be of a second conductivity type. Adam shows source, drain and control gate regions to be of n-conductivity type. Thus, Adam clearly meets the claim language. There is nothing in the claim which precludes some other region, e.g., diffusion region 4 of Adam, from being of a first conductivity type and, as explained supra, there is nothing in the claim which precludes Adam's diffusion region 4 at all. Accordingly, appellant's arguments are not persuasive.

The examiner's decision rejecting claim 16 under 35 U.S.C. §§ 102(b)/103 is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

AFFIRMED

Kenneth W. Hairston Administrative Patent Judge	)
Errol A. Krass Administrative Patent Judge	) BOARD OF PATENT) APPEALS AND) INTERFERENCES
Jerry Smith Administrative Patent Judge	)

Paul J. Winters
Skjerven, Morrill, Macpherson,
Franklin & Friel
25 Metro Drive, Suite 700
San Jose, CA 95110